Ontario Round Table on Environment and Economy

Table ronde de l'Ontario sur l'environnement et l'économie

Energy and Minerals Sectoral Task Force
Energy Sector

Draft Final Report

Ontario Round Table
on Environment and Economy
790 Bay Street
Suite 1003
Toronto, Ontario
M7A 1Y7

Telephone (416) 327-2032
Fax (416) 327-2197

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October 30, 1991

The Honourable Ruth Grier
Chair
Ontario Round Table on
Environment and Economy
790 Bay Street, Suite 1003
Toronto, Ontario
M7A 1Y7

Dear Minister:

The Energy and Minerals Task Force which the Round Table established earlier this year, is pleased to submit its Energy Sector report. A separate companion report on the Minerals Sector is also being forwarded to the Round Table.

Over the past six months, the Task Force has consulted as widely as possible with industry, associations, companies, environmental and other interest groups. The input we have received has been most valuable in focusing on the key issues for achieving greater sustainability in the sector.

The members of the Task Force appreciate having the opportunity to make a contribution to the important work of the Ontario Round Table on Environment and the Economy.

Respectfully submitted,

R.M.R. Higgin, Chair

G.G. Hatch

Michael P. Amsden

L.F. Moore

R. Bertell

Norman Rubin

M. Farrow

R. P. Shervill

J.B. Gammon

PREFACE

This report is one in a series prepared for the Ontario Round Table on Environment and Economy.

The Ontario Round Table was established by the Government of Ontario to develop a sustainable development strategy for the Province. To assist in the preparation of this strategy, in February of 1991 the Round Table established six sectoral task forces covering Agriculture and Food, Energy and Minerals, Forestry, Manufacturing, Transportation, and Urban Development and Commerce. A Native People's Circle also was established to provide the Native People's perspective on sustainable development. Each task force is made up of knowledgeable people involved in the sector and having a variety of perspectives.

The sectoral task forces were charged with developing a consensus and reporting to the Round Table on how best to begin to achieve sustainability in each sector within the context of the six principles for sustainable development set out by the Round Table in its Challenge Paper. Over the past eight months, using a combination of research and consultation, the task forces have documented the state of the sector and the obstacles to reaching sustainability, as well as providing recommendations for action. The consultation program also is described in each report.

The sectoral task force reports will be forwarded to the Ontario Round Table on Environment and Economy so that the recommendations can be considered by the Round Table as it prepares a Provincial sustainable development strategy.

Your comments on this document are welcome. Please send them to The Ontario Round Table on Environment and Economy, 700 Bay Street, Suite 1003, Toronto, Ontario, M7A 1Y7. For information call (416) 327-2161 collect.

EXECUTIVE SUMMARY OF ENERGY SECTOR REPORT

Background

The Energy and Minerals Task Force was established by the Round Table to provide input on the strategic issues and priority actions for implementing sustainable development in the energy and minerals sectors in Ontario. To facilitate this requirement, the Task Force designed a consultation program to seek out and receive input from sectoral stakeholders on issues pertaining to sustainable development within each of these relatively discrete economic fields.

Members of the Energy and Minerals Task Force were:

Dr. Roger Higgin (Chair) City of Toronto	Larry Moore Ministry of Energy	Maureen Farrow Coopers & Lybrand
Mike Amsden Falconbridge Limited	Norm Rubin Energy Probe	Dr. John Gammon Min. of Northern Dev. & Mines
Dr. Rosalie Bertell Institute of Concern for Public Health	Paul Shervill Union Gas Limited	Gerry Hatch Hatch and Associates

Following a series of internal workshops and a review of policy positions and reference materials, the Task Force developed two consultation documents which identified key issues, barriers and potential options for advancing sustainable development ideals in each of the energy and mineral sectors. These documents were distributed for comment to some 70 stakeholders from industry, governments at all levels, labour, environmental organizations and the native community.

Members of the Task Force participated in four general public sessions on sustainable development including a local Round Table forum in March, a green industry forum in April, a Town Hall meeting in Guelph in May, and a northern Ontario development forum, held in Thunder Bay, in June.

Two forums and a series of individual presentations were organized by the Task Force. The first, organized in cooperation with the City of Timmins, included a multi-stakeholder meeting and an open public forum. The second forum took the format of half day multi-stakeholder workshops for each of the energy and minerals sectors. A series of individual presentations was also made to the Task Force in response to received requests.

The Task Force reviewed the responses to its consultation document and the feedback it received from the above mentioned forums in preparing its conclusions and recommendations.

Task Force recommendations follow.

LIST OF RECOMMENDATIONS

Decision Making

1. The Government of Ontario should facilitate further deregulation and competition in the Ontario energy sector, rather than move to centralized planning and control.

2. The Government of Ontario should put in place a mechanism to facilitate regular collaborative multi-stakeholder input to, and review of, Ontario's long term integrated energy requirements and their associated environmental considerations.

3. The process for this review should be developed under the auspices of the Ontario Energy Board augmented by the Environmental Assessment Board with a report being forwarded to the government. Appropriate changes should be made to the applicable legislation to facilitate this review and to ensure adequate financial support for broad participation by public interest groups.

Energy Technology

4. The Government of Ontario should provide balanced incentives for new technology development and application, in particular, for low carbon and renewable energy technology. In addition, the Government of Ontario should urge the federal government to allocate part of its Green Plan funds to this objective.

5. The Government of Ontario should set tougher targets for energy efficiency and more stringent environmental standards for pollutants emitted through the combustion and use of energy sources.

6. The Government of Ontario and the private sector should enhance consumer education and incentive programmes for energy efficient products and services.

Comprehensive Data Bases

7. The Government of Ontario should establish an independent Centre of Excellence for Human Health and Ecosystem Integrity with the mandate to provide monitoring, database development, basic research and information dissemination across all sectors of the economy related to environmental conditions which pose a risk to human health and to ecosystems.

8. All Government of Ontario Ministries and Agencies which collect information on environmental conditions should provide this information to the Centre on an ongoing basis.

9. All Government of Ontario Ministries and Agencies involved in environment-related policy and programmes should publish "state of environment reports" and data on an annual basis.

10. Increased funding should be provided for basic data collection and research related to the assessment and definition of the risks posed by chemicals and other contaminants to human health and the natural ecosystem.

11. Industry, in cooperation with government, should undertake to establish better baseline data on the state of the natural environment.

Full Cost Pricing and Accounting

12. The Government of Ontario should establish a Task Force with key stakeholders from the energy sector and the Environment Section of the Canadian Institute of Chartered Accountants to determine how to move to fuller cost accounting in the energy sector.

13. The Ministries of Environment and Energy should jointly issue a discussion paper proposing practical ways of identifying, quantifying and beginning to incorporate legitimate environmental costs in energy development and pricing decisions. Issues to be addressed could include: the examination of carbon-equivalent and other emissions taxes; offsetting decreases in other taxes; and the means of preserving social equity in relation to access to energy services.

14. The Government of Ontario should encourage the Federal Government to expedite its commitments, set out in the Green Plan, to work with industry and stakeholders to gain better understanding and introduce practical demonstrations of tradeable emissions rights schemes.

15. The Ministry of Energy and the Ministry of Intergovernmental Affairs should study the issue of emissions trading with a view to striking an emissions trading treaty with the United States.

Energy and Competitiveness

16. The Government of Ontario should increasingly focus its existing business aid policies and programmes to encourage the successful development of businesses and industries with environmentally sound "clean" technologies and processes (eg. cogeneration, pollution control equipment, etc.).

17. The Government of Ontario should urge the Federal Export Development Corporation to allocate greater funds to environmental projects to exploit opportunities for appropriate Canadian technology in Eastern Europe and the Pacific rim.

18. The Government of Ontario should urge the Government of Canada to broaden the application of accelerated capital cost allowances for investment in energy efficient, low carbon and renewable energy technologies.

1. TASK FORCE FINDINGS AND RECOMMENDATIONS - ENERGY SECTOR

1.1 Introduction

The Ontario Energy Sector is a complex system of supply and distribution which provides consumers with choice and security of supply. Consumer choice exists between energy products and, to a lesser degree, sources of supply for petroleum products, natural gas and, in the case of some industrial users, electricity.

The environmental consequences of energy supply and consumption are significant globally, regionally and locally. These consequences are not properly reflected in either the information placed before government and corporate decision makers and energy consumers, or the costing and pricing of energy products and services. To adequately protect the rights of future generations, institutional structures and priorities need to change to ensure energy services are efficient, effective, and delivered with the least impact on the ecosphere.

Greater sustainability in the energy sector will require cooperation among government, industry and energy consumers to successfully address a number of issues relating to changing patterns of energy use and economic development. These issues include:

. Decision Making

. Energy Technology

. Comprehensive Data Bases and Monitoring Systems

. Full Cost Pricing and Accounting for Energy

. Energy and Competitiveness

1.2 DECISION MAKING IN THE ENERGY SECTOR

1.2.1 Background

The Ontario Energy sector consists of three relatively discrete market segments - oil, gas and electricity. Each segment is subject to different degrees of governmental regulation, ownership, taxation and subsidy.

The oil sector is subject to federal and provincial control over exploration and development Government royalties and taxation are imposed at all points along the path from crude oil production to the retail sale of gasoline and fuel oil. The pricing of Canadian crude oil is now deregulated and moves in concert with world prices for similar quality oil with destination-based differentials.

The natural gas sector is moving towards deregulation of the commodity with federal and provincial regulatory control remaining over transportation and distribution facilities and rates. The regulatory agencies involved are the National Energy Board (NEB) and the Ontario Energy Board (OEB).

The electricity sector is subject to a variety of federal and provincial statutes which control the expansion and siting of facilities. Ontario Hydro's rates for electricity are set by its Board of Directors, after consideration of the recommendations from the Ontario Energy Board's annual rate review. Ontario Hydro's Board also regulates the borrowing of, and rates charged by, Ontario's local municipal electric utilities.

The key decision making processes affecting Ontario's energy supply, and (to a lesser degree) demand sector, are shown below:

	Planning/Siting of Facilities	Commodity Prices	Service Rates
Oil and Petroleum Products	Various Federal & Provincial statutes, e.g. EPA	World price benchmark	Competition Branch
Natural Gas	Producing Province-AERCB, BCUC. National Energy Board, Ontario Energy Board	Deregulated	National Energy Board, Ontario Energy Board
Electricity	Various Federal and Provincial Statutes AECA, EAA, EPA	Set by Ontario Hydro Board. Bulk power rates subject to OEB review (Power Corp. Act, OEB Act)	

1.2.2 Stakeholder Views and Options

All stakeholders consulted by the Task Force agree that a non-adversarial approach, with multi-stakeholder involvement starting early in the planning process, is a preferred alternative to current planning processes. There is less consensus, however, on the specific multi-stakeholder processes that would work best. Views on this subject ranged from increased consultation regarding projects or plans by the proponent, through Round Table consensus-seeking, to full collaborative cooperative planning.

An important required change is recognition and acceptance by executives and energy planners in Ontario utilities, government Ministries and Agencies and Regulatory Commissions that a number of legitimate stakeholders in the planning process exist. These stakeholders include parties whose direct interests or indirect constituency interest is affected by both the overall plans of Ontario utilities or by specific projects or undertakings.

1.2.3 Task Force Conclusions

In the view of the Task Force, there is a notable lack of regular long range planning review processes for both the Ontario electricity and natural gas sectors. Further, no processes exist by which cross-fuel and cross-utility reviews can be undertaken. The periodic reviews that do occur are basically single fuel or utility in scope and they are often adversarial quasi-judicial processes which are costly and frequently the domain of lawyers and experts.

In the view of the Task Force, there should be a move to regular reviews of natural gas and electricity supply and demand, and of the long range system plans for Ontario utilities. The Government of Ontario should facilitate these reviews for the gas and electric sectors, and the review process should be changed to allow for greater stakeholder and public participation than at present. In addition, the Ministry of Energy should address the issue of how to achieve integration and long range planning across sectors and fuel/energy forms.

The Task Force has a strong preference for collaborative or cooperative planning and review processes. These should be established within the framework of the existing legislation as opposed to outside it. Under the collaborative planning model, stakeholder groups would work with the utilities, under government or regulatory agency supervision, to input to the long term energy plans for Ontario. Issues on which there was no consensus, and only those issues, could be put to a formal hearing for resolution.

The collaborative planning process should consider economic, environmental and social matters. To achieve this within the legislative framework may require changes to the relevant Acts.

The Task Force also believes that in the longer term, the government should move to facilitate greater diversification and competition in Ontario's electricity supply sector. This would mean allowing industry a greater choice of supply sources including self-generation, private power and purchases from other utilities. The Task Force emphasizes that ownership of the transmission

and distribution system should remain as at present. Changes should only be made to only facilitate transportation of power of other public or private generators.

The oil sector presents a special challenge, since the applicable legislation and taxation powers lie largely outside the jurisdiction of the Province of Ontario. The exception to this is the provincial gasoline tax, however, the Task Force does not believe this provides an adequate handle or lever to address energy/environmental planning issues in the oil sector. Consumption taxes such as a carbon tax may influence the demand and, indirectly the supply infrastructure for petroleum products, but do not directly address the long range planning issue. This is of concern to the Task Force, since the oil sector likely has the largest impact on carbon emissions and global warming.

Rather than suggest inappropriate or unrealistic changes to planning and decision making processes for the oil sector, the Task Force looks to the recommendations of the Transportation Task Force to propose strategies to improve the efficiency of the Ontario Transportation Sector and, thereby, reduce the demand for transportation fuels in Ontario.

1.2.4 Task Force Recommendations

1. The Government of Ontario should facilitate further deregulation and competition in the Ontario energy sector, rather than move to centralized planning and control.

2. The Government of Ontario should put in place a mechanism to facilitate regular collaborative multi-stakeholder input to, and review of, Ontario's long term integrated energy requirements and their associated environmental considerations.

3. The process for this review should be developed under the auspices of the Ontario Energy Board augmented by the Environmental Assessment Board with a report being forwarded to the government. Appropriate changes should be made to the applicable legislation to facilitate this review and to ensure adequate financial support for broad participation by public interest groups.

1.3 ENERGY TECHNOLOGY

1.3.1 Background

Improved energy supply and end use technologies offer significant opportunities to reduce the environmental impacts associated with the supply of energy and the delivery of energy services to consumers. They can also help to increase our competitiveness by increasing efficiency and by developing and commercializing new product and market opportunities. Process and product technology developments require sizable investments of money and technical personnel. Their successful implementation requires coordinated efforts on the part of managers, scientists, engineers and operations personnel.

Technology development and innovation have been fostered in part by government environmental regulations and by the market potential for energy technologies. It is important to note that many energy efficient end use technologies were developed during, and following, the energy crises of the 1970s and offer the potential for improving efficiency and competitiveness while reducing costs. The majority of these technologies to date remain under utilized in the market place.

Environmental control technology can be designed to capture and reduce the release of pollutants to the environment (back end) or to ensure that pollutants are not manufactured in the first place (front end). Combustion technology for coal and oil has largely focused on back end technologies such as scrubbers. Efficient front end combustion technologies have not come to the fore to the extent that they are needed. The net result has been a shift to higher grade fuels and expensive nuclear electricity generation technologies.

New technology can not be considered as a panacea or "fix" for all environmental problems. However, applying improved technology to energy supply and use will help ensure that our needs can be met without posing unacceptable risks to ourselves or our biosphere.

1.3.2 Stakeholder Views and Options

Most stakeholders recognized the value of promoting alternative energy supply technologies and encouraging more appropriate end uses for certain energy forms. Promising alternative supply options include cogeneration and energy from waste and small scale renewables such as solar and hydraulic. Promising demand side alternatives include district heating and more fuel efficient end use technologies such as cars, appliances and buildings. Stakeholders generally recognize the limitations of technology. Better technology will not, in itself, correct the "wasteful" attitudes we have developed as a society towards energy use.

Key barriers cited to the development and application of new energy technology include the low buy-back rate for non-utility generated electricity; convoluted approvals processes for smaller scale energy developments and the low price for energy commodities in general, partly because of the exclusion of environmental costs in energy prices.

Many stakeholders pointed to the need for credits or reduced taxes for more environmentally benign energy supply and end use technologies, in contrast to the predominant focus of government and industry on the delivery of conventional solutions to energy supply and use. Other comments were: the lack of focus on integrated resource planning and demand management practices by the larger provincial utilities; the difficulty in successfully marketing new technology to potential consumers; the small market potential for home grown technology; the need for more government incentives and partnerships to explore the full potential of alternative fuels; and the lack of available information relating to linkages between energy, environment and economy.

1.3.3 Task Force Conclusions

Task Force members recognize the potential for improved energy technology to reconcile environmental and economic goals and the export opportunities associated with improved energy technologies. Realizing this potential will require significant changes.

The Task Force concludes that there is a need to revisit alternative and renewable energy sources and to take a more comprehensive approach to energy technology development with special focus on products and services which are less carbon-intensive. There is also a need to assist the public in their understanding of the environmental risks and benefits of particular energy technology choices through monitoring, information and improved product literature and labelling.

Cooperative efforts among those involved in pure and applied research are required to effectively utilize the scarce resources available to society for research and development initiatives. A new focus should be the provision of greater incentives for the development and adoption of environmentally and economically sustainable energy technologies by both producers and consumers. Demonstration and consumer education are important components of stimulating demand for resource efficient technologies.

1.3.4 Task Force Recommendations

4. The Government of Ontario should provide balanced incentives for new technology development and application, in particular, for low carbon and renewable energy technology. In addition, the Government of Ontario should urge the federal government to allocate part of its Green Plan funds to this objective.

5. The Government of Ontario should set tougher targets for energy efficiency and more stringent environmental standards for pollutants emitted through the combustion and use of energy sources.

6. The Government of Ontario and the private sector should enhance consumer education and incentive programmes for energy efficient products and services.

1.4 COMPREHENSIVE DATA BASES AND MONITORING SYSTEMS

1.4.1 Background

In order to provide complete baseline and state of the environment information related to energy production and use, a great deal more scientific, technical and social information needs to be collected, analyzed and disseminated. To be credible, this information needs accurate, relevant, independent and be capable of capturing past, present and future consequences of our choices. Both stakeholders and the Task Force feel this can be best accomplished through a public monitoring and open reporting system.

1.4.2 Stakeholder Views and Options

Most stakeholders consulted recognized both the deficiency in current data sources and lack of ability to draw meaningful conclusions from these sources.

1.4.3 Task Force Conclusions

The Task Force agrees that basic to this effort is effective collection of relevant data. Ingredients of a relevant monitoring system include:

- Standardization of air, water and land monitoring for toxic substances to facilitate information sharing with neighbouring jurisdictions.

- Monitoring and data collection on ecosystems, including localized habitats, biodiversity, reproductive integrity, growth and hardiness, in a way which facilitates sharing with neighbouring jurisdictions.

- Human health data collection on sensitive parameters such as hospital admissions for respiratory emergencies, ischemic heart episodes, outbreaks of serious infectious disease (immune incompetence), endocrine and nervous system dysfunction and adverse pregnancy outcomes, in a way which facilitates sharing data with neighbouring jurisdictions.

- Scientific efforts to recoup the historical trends for each of these aspects of the ecosystem and determine valid parameters describing the interaction of these variables, supplementary toxicological and clinical studies, and better utilization of data already being collected within isolated medical, biological and chemical specialities.

- Biological and ecological alarm systems to give early feedback on the development of policies and projects which can be expected to have serious negative effects in the future.

The current system of regulation, which neglects the interactive effects of multiple pollutants and multiple pathways, and which focuses on such extreme and late health effects as cancer, is seen as inadequate for the complex 21st century society.

The findings of monitoring and data collection systems will need to be utilized in a major way for decision making on industrial and energy strategy, such as electrical generation, transportation, status of mining and metallurgy, environmental standards, labour legislation, competitiveness, direct and indirect contributions to Ontario's economy, and willingness to risk Ontario for the sake of international competitiveness.

1.4.4 Task Force Recommendations

7. The Government of Ontario should establish an independent Centre of Excellence for Human Health and Ecosystem Integrity with the mandate to provide monitoring, database development, basic research and information dissemination across all sectors of the economy related to environmental conditions which pose a risk to human health and to ecosystems.

8. All Government of Ontario Ministries and Agencies which collect information on environmental conditions should provide this information to the new Centre on an ongoing basis.

9. All Government of Ontario Ministries and Agencies involved in environment-related policy and programmes should publish "state of the environment reports" and data on an annual basis.

10. Increased funding should be provided for basic data collection and research related to the assessment and definition of the risks posed by chemicals and other contaminants to human health and the natural ecosystem.

11. Industry, in cooperation with government, should undertake to establish better baseline data on the state of the natural environment.

1.5 FULL COST PRICING AND ACCOUNTING FOR ENERGY

1.5.1 Background

Social and environmental externalities result from activities associated with energy production and use. These environmental effects include global warming, acid precipitation, urban air pollution, toxic emissions, water impoundment and radioactive emissions. Land effects from transmission corridors, spills etc. are also generally not reflected in the price of energy. Furthermore, the liabilities related to these risks are largely unaccounted for in the energy prices paid by the consumer.

An extensive infrastructure as well as large capital investments are required to ensure the delivery of energy commodities to end users. The current pricing structures for most energy commodities are based primarily on the cost of resource extraction, upgrading and delivery. Environmental and social effects of energy systems are not generally captured by pricing or accounting systems.

With energy playing such a central role in western society, governments have undertaken in some cases, to ensure that the reliability of energy supply and price are maintained through supply side incentives. Accordingly, prices for most traditional energy commodities do not reflect their full cost resulting in excessive levels of demand, waste and inefficient uses. With relatively low historic energy prices in both Ontario and Canada, our industrial sector is comprised of energy and resource intensive industries that compete internationally, marketing a large percentage of their products in world commodity markets.

Removing subsidies, increasing competition, levelling rate structures and correcting for environmental and social externalities through managed and agreed upon means, can provide the necessary incentives to encourage greater sustainability and efficiency in the energy sector by both producers and consumers.

1.5.2 Stakeholder Views and Options

Stakeholder views on the issue of full costing of energy varied considerably. Several of those involved in the supply of traditional forms of energy are reasonably positive towards full cost accounting. Included in this group are those with an interest in the extension or growth of markets for their more environmentally benign commodities, such as the natural gas and renewable energy industries. Those representing the oil and coal industries and heavy users of energy are generally against fully pricing energy resources.

Ontario Hydro is generally in favour of moving toward a pricing system that more fully reflects environmental costs, but its large industrial customers consistently argue for the exercise of caution in this regard.

Large power consumers suggest that further study is required and that both the costs and benefits of full cost accounting need to be completely assessed. The link between full cost accounting and competitiveness is also often raised by these energy users. They advocate a "level international playing field" and the avoidance of unilateral action (especially in the area of global warming). However, this group also advocates taking action in areas that benefit both our economy and environment, such as the uptake of cleaner, more resource efficient technology and improved energy efficiency, especially where government funds are used to facilitate achieving these objectives.

Environmental groups and other organizations in favour of decentralization of energy supply are generally in favour of moving towards full cost pricing. Several environmental groups expressed concern about the social equity dimensions of pricing energy at its full cost. Income support is advocated in this regard. Some environmental groups are more in favour of directly penalizing inefficiency and rewarding energy efficiency as an alternative or supplement to raising the overall price of energy commodities.

Other comments raised included: compliance with standards by industry should be considered as full cost accounting; the underpricing of energy commodities has grossly skewed the structure of society, thereby making many of the more environmentally benign energy sources uncompetitive; raising prices would spur the development of more efficient and environmentally benign technologies; industry needs competitively priced resources to survive; all energy forms should carry "cradle to grave" full costs; and the right price signals are an important component of consumer education and informed energy decisions.

1.5.3 Task Force Conclusions

Full cost accounting and pricing of energy resources is at the heart of the sustainable development debate. In the long term, efficiency, competitiveness, alternative forms of supply and biosphere protection can all be assisted through pricing energy (and other commodities) at a level that reflects its true cost.

International and domestic subsidies as well as the exclusion of environmental and public health costs both here and abroad, significantly distort the market system.

The Task Force acknowledges that in the short term, considerable down side may exist for many large industrial energy consumers and for single industry resource dependent towns, if the government allows rapid and unilateral increases in the price of energy commodities. For this reason, government should not mandate immediate full cost energy pricing.

Although Ontario, acting alone, can not solve global warming or other world environmental problems, leadership in this area can be an important signal.

Requirements to meet tougher standards through the use of best available and economically achievable technology, while important in internalizing some of the costs of energy use, do not go far enough in providing appropriate price signals.

Consumer education is a critical component of pricing energy at its full cost. Correct price information is essential for the market to operate in an efficient manner. Pricing energy sources at their full cost provides essential market feedback.

In sum, the Task Force concludes that while much more study of full cost accounting and full cost energy pricing needs to be undertaken, the restructuring of government incentive and support programmes should be an early priority. Following this, a broader look at environment-related taxes should be undertaken. The economic and social impacts of any policy changes should be carefully examined before implementation.

1.5.4 Task Force Recommendations

12. The Government of Ontario should establish a Task Force with key stakeholders from the energy sector and the Environment Section of the Canadian Institute of Chartered Accountants to determine how to move to fuller cost accounting in the energy sector.

13. The Ministries of Environment and Energy should jointly issue a discussion paper proposing practical ways of identifying, quantifying and beginning to incorporate legitimate environmental costs in energy development and pricing decisions. Issues to be addressed could include: the examination of carbon-equivalent and other emissions taxes; offsetting decreases in other taxes; and the means of preserving social equity in relation to access to energy services.

14. The Government of Ontario should encourage the Federal Government to expedite its commitments, set out in the Green Plan, to work with industry and stakeholders to gain better understanding and introduce practical demonstrations of tradeable emissions rights schemes.

15. The Ministry of Energy and the Ministry of Intergovernmental Affairs should study the issue of emissions trading with a view to striking an emissions trading treaty with the United States.

1.6 ENERGY AND COMPETITIVENESS

1.6.1 Background

Ontario has historically enjoyed relatively low energy prices and much of the province's industrial sector is comprised of energy- intensive resource industries. The relative dominance of these traditional resource based industries has declined during the 1980s but they will remain important to the provincial economy during the 1990s. In recent years, the price of energy has risen, particularly electricity prices, and there are serious concerns in some industrial sectors (including base metal, iron and steel, pulp and papers and chemicals) that this poses a significant threat to their competitive position, given the highly competitive world markets in which they compete. Any additional price increases, due to the internalization of environmental costs, would add to this threat. The trade-offs between environment and economy are at the centre of the concerns about competitiveness for many energy intensive industries.

1.6.2 Stakeholder Views and Options

As with most of the issues considered, the Task Force heard many unique and often contradictory views on the issue of maintaining economic competitiveness. Generally, the issue was most often discussed in relation to full cost accounting and the role of government.

With regard to full cost accounting, competitiveness was raised in two different contexts.

Many stakeholders felt that a systematic means of quantifying environmental impacts was required in order to more fully reflect the true cost of energy production and use. On this, there was little dissention. Some stakeholders argued that this new order of accounting ought to be implemented in a cautious, reasoned way so that Ontario does not unduly overprice its goods and services by over-valuing or over-accounting for these externalities. The province's major energy consumers point out that they must remain healthy and viable to invest in improved energy technologies.

A second context for competitiveness concerns was interfuel competition. All energy forms must be treated equally with comparable taxation, royalties, costs of capital and rates of return being taken into consideration. It was asserted that this would place all energy forms on a level playing field and provide a clear road map to the most appropriate energy choices for the future.

Competitiveness issues were also raised in discussions of the appropriate role for government in moving towards a more sustainable energy future. Invariably, the question was raised as to whether governments ought to drive environmental improvement through "command and control" regulatory measures or whether a reformed market for energy goods and services would determine the appropriate values in due course.

Some environmental groups prefer strong government regulatory action because there are always market imperfections which distract from the true value of environmental resources and true costs of environmental damage. Other groups are generally more trusting of the marketplace, likely because of greater familiarity, but also because of a concern about unilateral government action.

The Canadian Government's unilateral commitment to a stabilization of carbon dioxide and other greenhouse gases at 1990 levels by the year 2000, was cited as an example of insufficient concern for Canadian competitiveness. Many business stakeholders feel that the energy intensive structure of the Canadian economy was not being adequately accounted for, with the result that Canada was being labelled unfairly as an "energy hog". Others feel that emissions per capita is the best measure of performance even if it might disadvantage Canadian energy-intensive, resource-based industries compared to their trading partners.

Encouraging a move within the marketplace to more efficient technologies such as cogeneration was also advocated to improve the bottom line performance of Ontario business and, in so doing, make it more competitive.

1.6.3 Task Force Conclusions

The competitiveness of Ontario businesses could be negatively affected by a rapid and unilateral move to internalizing environmental and public health costs in the price of energy services. Conventional wisdom suggests that to be successful in the global marketplace, Ontario must be on the leading edge but not the "bleeding edge". This will require the Ontario economy to move forward on better quantifying and integrating environmental costs in economic decisions.

The pioneers in any field often develop lucrative business opportunities from the knowledge and equipment developed. As an example, the private power business in the United States, using highly efficient cogeneration technology, has become a multi-billion dollar business. More attention must be paid to developing sustainable energy forms and advancing research into efficiency improvements in end-use technology. Economic progress, as discussed earlier, cannot proceed at the expense of a depleted resource base and a damaged environment.

On the issue of the appropriate role for government in the 1990s, we are convinced that a combination of government intervention and marketplace economics will be necessary. For the most part, the market will determine the appropriate means of remaining competitive in the future. Where there are marketplace failings (e.g. inequity in taxation/subsidies, etc.), or imperfect information (e.g. not understanding in advance the effect that chlorofluorocarbons have on stratospheric ozone) the government must intervene to ensure that appropriate action is taken to protect the biosphere. Greater understanding of the value and appropriate role for economic instruments, such as tradeable emission credits, must be gained in short order. A government-industry-stakeholder partnership will be required.

1.6.4 Task Force Recommendations

16. The Government of Ontario should increasingly focus its existing business aid policies and programmes to encourage the successful development of businesses and industries with environmentally sound "clean" technologies and processes (eg. cogeneration, pollution control equipment, etc.).

17. The Government of Ontario should urge the Federal Export Development Corporation to allocate greater funds to environmental projects to exploit opportunities for appropriate Canadian technology in Eastern Europe and the Pacific rim.

18. The Government of Ontario should urge the Government of Canada to broaden the application of accelerated capital cost allowances for investment in energy efficient, low carbon and renewable energy technologies.

APPENDICES

A. Background to Ontario Energy Sector

B. Stakeholder Lists and Views

C. Energy Sector Consultation Document

APPENDIX A BACKGROUND TO ONTARIO'S ENERGY SECTOR

This Appendix is divided into three sections: the first outlines background information on Ontario's energy sector; the second outlines some of the environmental impacts of energy-use in Ontario with a particular emphasis on carbon dioxide emissions and global warming, and; the third outlines several relevant and current energy forecasts. The primary sources of information for this background section are from the most recent publications of the Ontario Ministry of Energy (MENY).

A-1 BACKGROUND TO ONTARIO'S ENERGY SECTOR

Canada and Energy: A World Comparison

Canada, considering its population and the size of its economy, is a heavy user of energy. Canada uses more energy per dollar of output than any other major industrialized country. By comparison, the United States' energy use per dollar of output in 1986 was 86 percent of Canada's, Sweden's 87 percent, West Germany's 72 percent, France's 56 percent, and Japan's 47 percent.

One explanation is that the Canadian economy includes more than its share of energy intensive resource industries. Canada, with only 4 percent of the total economic output of the Organization for Economic Co-operation and Development (OECD) countries, accounted for 40 percent of newsprint production, 33 percent of aluminum production, 30 percent of nickel production, 17 percent of iron ore production, and nearly 10 percent of OECD production of copper, zinc, lead, and synthetic ammonia (1983).

Canadian provinces differ substantially in their patterns of energy use, depending on availability of resources and type of industry. Ontario accounts for approximately its share (per unit of GNP) of national consumption of crude oil (33 percent) and natural gas (40 percent), somewhat more coal (53 percent), and somewhat less wood and other sources (24 percent). The main differences are that Ontario uses far more nuclear power (87 percent of the national total) and far less hydro-electric power (12 percent) than the nation as a whole.

Ontario Energy Supply and Demand (Consumption) in 1989

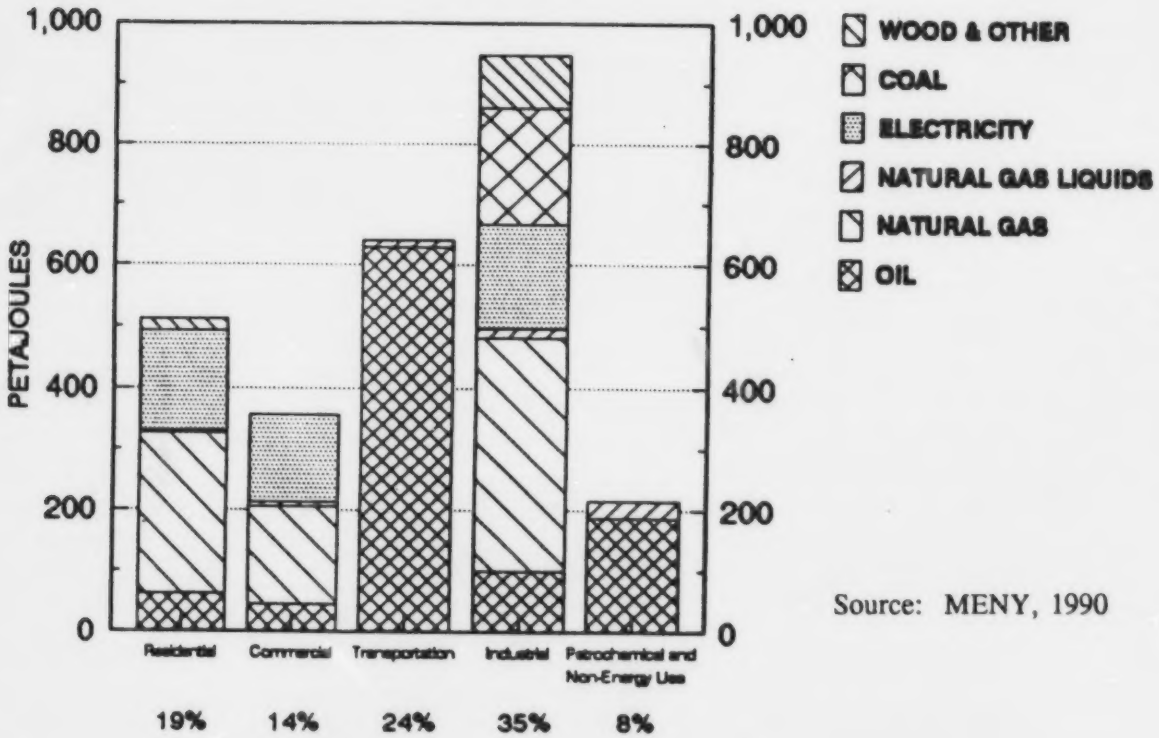
Ontario is predominantly an energy consuming province, accounting for about 33% of total Canadian energy use. Industry accounts for 35% of end use consumption, followed by transportation (24%), residential (19%), commercial (14%), and petrochemical and non-energy uses (8%). End use consumption of energy in 1988 amounted to 2570 petajoules. With a growing population and economy, Ontario's demand for energy in homes, vehicles, buildings, industries and farms is expected to further increase.

The use of the various forms of energy varies from sector to sector (see Table 1). For instance, whereas petroleum products provide almost all the energy for transportation (98 percent), they provide only 10 percent of the energy used by industry. Natural gas is the mainstay of the residential (53 percent) and commercial/institutional (46 percent) sectors. Apart from its contribution to electricity generation, coal is used only in the industrial sector, mostly in the iron and steel industry.

Almost all of the oil, gas and coal consumed in Ontario is imported into the province. In 1988, 61 percent of Ontario's primary energy came from other provinces, chiefly Alberta (47 percent) and Saskatchewan (12 percent). Although crude oil purchases from Alberta were lower than a decade before, purchases of uranium, lignite coal, and natural gas from Saskatchewan increased. An additional 13 percent of primary energy came from the U.S., mainly American coal for Ontario steel plants and coal-fired power stations. Electricity generated from hydraulic sources and most of the uranium used in nuclear generation are indigenous resources. Though Canada produces all the main primary energy sources in abundance, Ontario produces very little crude oil, natural gas, or coal. Not surprisingly, therefore, Canada exports energy, while Ontario purchases/imports energy from western provinces and from the United States.

Table 1

Ontario's End-Use Energy Consumption by Sector and Fuel 1989

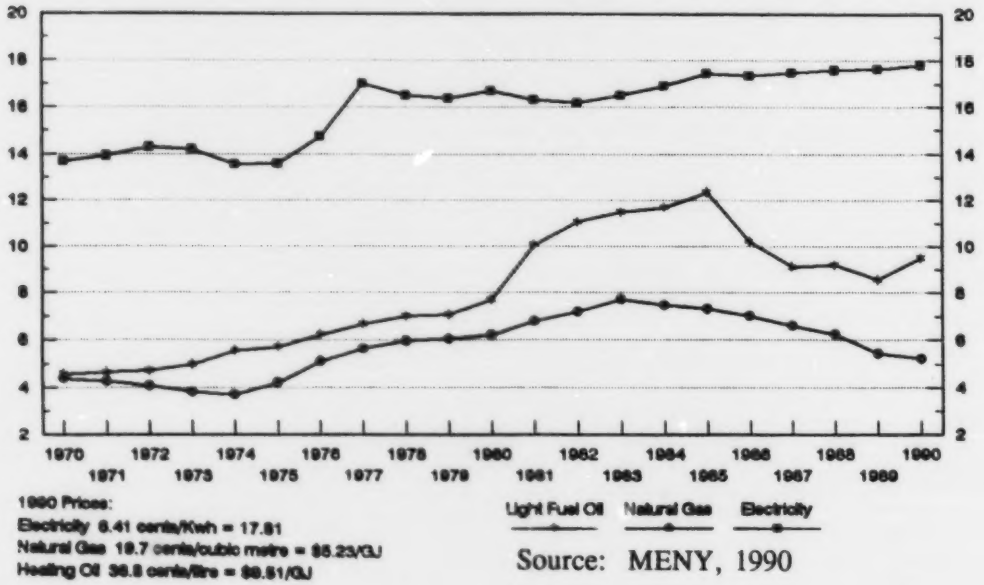


Source: MENY, 1990

Ontario's primary sources of indigenous energy are water-power and uranium for electricity production. (Although 30 percent of the uranium for nuclear stations now comes from Saskatchewan). The remainder of Ontario's primary indigenous energy is wood and waste used by the forest industries, and small amounts of crude oil and natural gas produced in southwest Ontario.

Most of Ontario's needs for oil, gas and electricity are provided by a few large suppliers. The oil industry consists of 4 major suppliers of petroleum products and their affiliated retailers, and a large number of independents. The gas sector has three large regulated utilities supplying almost 2 million customers. The electricity sector consists of Ontario Hydro, 311 municipal electric utilities and a few private utilities. Significant competition for market share exists between energy commodities and suppliers in the stationary and transportation sectors. However until recently gas to gas competition did not occur and there is next to no electricity to electricity competition.

Table 2 - Ontario Residential Energy Prices 1970-1990 (1990$/GJ)



Source: MENY, 1990

Since 1970 oil and gas prices in Ontario have gone through two successive rises, first in 1973 and then more steeply in 1979, followed by a large drop in 1986. Electricity prices have changed less dramatically. They rose steeply in 1976-77 and more modestly since then, rising in line with the general rate of inflation from the early 1980's until 1989. In current dollars, electricity and gasoline were more than four times as expensive in 1988 as in 1970, heating oil six times, and natural gas more than five times. However, current dollar amounts omit the effect of inflation, which since 1970 has increased all prices and reduced the value of a dollar by more than three times. Over this period, therefore, the increase in the real cost of energy to the consumer (in constant dollars) has been much more modest.

Energy and Economic Development

Abundant energy resources have been a cornerstone of the development of the Canadian economy. Between 1983 and 1987, the energy sector represented an average of 8% of Canada's Gross Domestic Product (GDP), 19% of gross investment, 12% of gross export income, and 4% of employment. Energy expenditures represent a significant component of the budgets of industry, governments, and individuals.

Energy trade in the North American region has constantly grown in importance. Given that Ontario is a net-importer of energy, the potential significance of the Canada/U.S. Free-Trade Agreement is less for this province than others. With progressively more relaxed trade restrictions and reduced regulatory control over energy trade, large capital investments of the magnitude of C$ 250 billion over the next two decades, are expected in the oil, gas and electricity supply industries.

Until the late 1970s, energy use in Ontario tended to grow at about the same rate as the provincial economy. The year 1979 saw the beginning of a dramatic slow down in energy growth. From 1979 to 1988, while the Ontario economy grew by 39 percent, total end-use energy consumption grew only one tenth as much (4 percent). Although significant improvements in energy efficiency were achieved during the 1980's, some sectors within Ontario and Canada still lag behind their counterparts in other industrialised countries in terms of energy efficiency.

The slow down in energy consumption growth was greatest from 1979 to 1985 when oil, natural gas, and coal prices reached unprecedented levels and the economy went through a severe recession. Since 1986, lower oil and natural gas prices have stimulated energy consumption, but demand continues to grow more slowly than the economy.

A-2 ENVIRONMENTAL IMPACTS OF ENERGY USE

Introduction

Energy production and use result in a number of environmental impacts including air and water pollution, land degradation and radiation and radionuclide build-up. This section addresses only air contaminants from the combustion of fossil fuel, which are of concern on a global, regional and local scale. The principal global concerns relate to the impact of greenhouse gases and carbon dioxide from fossil fuel burning. There are also concerns about stratospheric ozone depletion resulting in part from the release of chlorofluorocarbons (CFCs) into the atmosphere from air conditioning units.

Under the Canada/U.S. Free Trade Agreement, Canada and the U.S.A. will share a common continental energy future as well as a common air and water natural environment to a considerable degree.

Regional concerns about acid rain and the effects of other regional air contaminants are often energy related. There also exist a number of local impacts resulting from energy production and use. Most of these relate to urban air quality.

Global Impacts

Human activities have significantly increased the rate of change of atmospheric concentrations of carbon dioxide (CO_2). The atmospheric CO_2 concentration of about 350 parts per million measured in the late 1980s is about 20-25% higher than at any time in the past 160,000 years (concentrations during the previous ice age dropped to around 200 parts per million). By the beginning of the industrial revolution, CO_2 concentrations had risen to 280 parts per million. Over the past 100 years, CO_2 concentrations have risen by a further 70 parts per million, with more than half of this increase occurring in the last 30 years. Globally, anthropogenic CO_2 emissions have more than tripled since 1950. Responsibility for these emissions is widely shared among major world regions.

In Canada, as well as globally, emissions of CO_2 increased steadily up to 1979. Between 1920 and 1979, Canadian CO_2 emissions from energy (which constitute over 90% of total Canadian CO_2 emissions) increased by about 500%. The rate of increase accelerated in the period after 1945, coincident with increases in economic growth and fossil fuel use. On a per capita basis, Canadian emissions of CO_2 and other greenhouse gases were among the highest of the countries belonging to the Organization for Economic Co-operation and Development (OECD).

While Ontario produces only about one percent of global CO_2 emissions, it produces roughly a third of Canada's emissions. Carbon dioxide emissions related to Ontario's energy use totalled 164 megatonnes in 1988. Looking at the direct emissions from fuel use, the industrial sector was the source of 30% of these emissions, with the iron and steel industry alone responsible for 12%. Transportation accounted for 26%, largely for gasoline and diesel use in cars and trucks.

Residential and commercial buildings produced 19% of emissions from their use of heating fuels, and oil refineries and pipelines 5%.

Significantly, in the period 1978-1988 in which the effect of oil supply and pricing problems sparked major energy efficiency efforts, Canada like other countries has seen a slight reduction in CO_2 emissions. Canada recently announced its intention to stabilize emissions of CO_2 and other greenhouse gases at 1990 levels by the year 2000. This will be particularly challenging since the rate of structural change seen in the 1980's is not expected to continue without dramatic action by government or a return to rapid energy price increases.

Heightened scientific concern about global warming culminated, at the Second World Climate Conference in Geneva in October 1990, in a far reaching consensus about the causes and potential effects of global warming, and possible remedial policies to slow down the rate and reduce the ecological risks of warming. In its final conference statement, scientists and energy experts attending the conference agreed that:

- without action to reduce emissions of greenhouse gases from human activities, global warming is predicted to reach 2-to-5° C over the next century, a rate of change unprecedented in recorded human history, and the warming is expected to be accompanied by a sea level rise of 30-to-100 centimetres;

- a continuous world-wide reduction of net CO_2 emissions of 1-to-2 percent per year would be required to stabilize CO_2 concentrations in the atmosphere by the middle of the next century;

- many studies conclude that technical and cost-effective opportunities exist to reduce CO_2 emissions by at least 20 percent by 2005 in industrialised nations;

- industrialised countries must implement reductions even greater than those required, on average, for the globe as a whole, in order to allow for growth in emissions from developing countries.

Global warming is expected to affect Ontario's economy and natural resource base including water, soil and biota. Studies recently commissioned by Environment Canada of the potential regional effects suggest that if atmospheric CO_2 doubles, adverse effects may outweigh positive effects in Ontario.

Regional and Local Impacts

The principal local air contaminants related to energy production and use include:

(i) Sulphur dioxide (SO_2) and nitrogen oxide (NO_x)
(ii) Total suspended particulates (TSP)
(iii) Nitrogen dioxide (NO_2) and carbon monoxide (CO)

(iv) Ground-level ozone
(v) Volatile organic compounds (VOC)
(vi) Lead

Under the Countdown Acid Rain Program, province-wide emissions of sulphur dioxide (SO_2) are being cut to 885 thousand metric tonnes by 1994, compared to the 1980 base case of level of 2,194 kilotonnes. Progress in this area by our American neighbours is expected so that they will in turn reduce the 50% of Ontario's acid deposition which originates in the United States.

Four corporate sources which account for approximately 80% of SO_2 emissions generated in Ontario are regulated under the Count Down Acid Rain Program (except Ontario Hydro which has agreed to participate on a voluntary basis). Staged reductions are required during the 1986 to 1994 period. The four major SO_2 sources are Inco Ltd., Falconbridge Ltd., Algoma Steel Corporation Ltd., and Ontario Hydro.

National air quality standards have been established for nitrogen oxides, carbon monoxide and other air pollutants and are documented by the National Air Pollution Surveillance (NAPS) service. The NAPS data show that, over the last 15 years, ambient levels of nitrogen dioxide (NO_2) and CO in urban areas have decreased by approximately 28% and 55%, respectively. This decline is attributed to more efficient motor vehicles and the use of pollution control devices. However, NO_2 emissions have increased since 1988, whereas CO emissions have remained relatively stable.

The NAPS data also indicate that the annual average of high ozone levels has consistently hovered around the maximum acceptable level for the last decade. The peak in 1988 is attributed to higher than normal summer temperatures. Ground level ozone has both urban and regional impacts. In summer months, more than half of all Canadians are exposed regularly to ambient air ozone concentrations above the maximum acceptable level. During severe ozone episodes, such as those that occurred in 1988, people in some major Canadian cities have been advised to limit outdoor physical activity or stay indoors. Crop damage in Ontario alone from elevated ozone levels throughout the summer growing season is estimated at up to $70,000,000 per year.

NO_x and VOCs, the precursor pollutants that cause ground level ozone, derive from many different sources. NO_x is released primarily (95%) during the combustion of fossil fuels such as gasoline, diesel fuel, heavy fuel oil, natural gas and coal. This combustion takes place in automobile, trucks, construction engines, combustion turbines, industrial boilers, power plants and other facilities that use fossil fuel as an energy source. VOCs are released during the combustion of gasoline, from various industrial processes, and from the evaporation of liquid fuels, solvents and organic chemicals. Sources of VOC emissions include the automobile, gasoline distribution systems, refineries, chemical plants, the application of paints and coatings, a variety of solvent uses, and other source categories.

Nationally, both NO_x and VOC emissions are projected to grow by about 6 percent between 1985 and 2005, if no new controls are put in place. This will increase ozone levels in key problem areas, and contribute to the creation of new problems in areas that are now marginal with respect to attainment of the maximum ozone level. There will be some variations in the trend in ozone levels between provinces and between regions within provinces which will require that each region be examined separately in developing an ozone control strategy. Another factor in determining which source sectors to control is the variation between regions in the contribution of NO_x or VOC emissions from given sectors to the ozone problem.

Because of concerns about lead's adverse health effects, strategies to reduce emissions of lead generally and from gasoline in particular, have been in place since 1974. Emissions of lead from gasoline peaked in 1973 at over 14,000 tonnes (about 70% of total lead emissions) and have been in decline ever since. In 1990, lead use in gasoline was phased out in Canada.

A-3 ENERGY DEMAND FORECASTS AND CO_2 EMISSION ESTIMATES

Various forecasts were reviewed to provide a basis for examining future trends. Two forecasts have been selected based on their relevance to Ontario.

These two forecasts on energy demand and CO_2 emissions are the 1991 National Energy Board Supply/Demand Forecast and the Ontario Ministry of Energy's revised 1989 Reference scenario forecast (which includes a High Conservation scenario).

A-3-1 Canadian Energy Demand Forecasts

National Energy Board (NEB) - Taken from the report titled **"National Energy Board - Canadian Energy: Supply and Demand 1990 - 2010" (June 1991)**

The general approach taken in this report differs considerably from past NEB forecasts in that only a single projection is made (called the "Control Case) based on one set of world oil price and economic growth projections, and subjected to various sensitivity tests. The Control Case is not viewed as a most likely projection, but rather as a centre point for the sensitivity tests. Also different from past NEB forecasts is the inclusion of estimates of emissions of gases from the production and use of energy, including those gases linked to the greenhouse effect, acid rain, and low-level ozone.

In the Control Case, NEB assumes long-term economic growth of about 2.3 per cent per year for the study period 1989 to 2010. The population is expected to grow at 0.9 per cent for both Ontario and for Canada as a whole. The price of oil is expected to be within the range of $20 in 1991 to $37 in 2010. The Control Case, which represents the middle ground, ranges from $20 in 1991 to $27 in 2010 (1990 Canadian dollars). Real natural gas prices are not expected to grow for the study period. Control Case Alberta natural gas prices increase from $1.40 per gigajoule in 1992, to $4.20 in 2012, and sensitivity cases produce a range of $3.50 to $4.65 by

2012 (in 1990 Canadian dollars).

NEB's expectations for energy demand growth are low for Canada averaging 1.2 per cent a year (1990 - 2010). Projections are based on modest economic growth, ongoing energy efficiency improvements associated with technological change, environment-related measures considered viable given the price outlook, and demand management programs.

Based on the domestic energy supply and consumption outlook, projections for gaseous emissions have been made with consideration given to environmental policies in place as of 1990, and ongoing improvements in energy efficiency. Carbon dioxide emissions are expected to grow at an average of 1.1 per cent per year, nitrogen oxides to increase an average of 0.2 per cent, volatile organic compounds to decrease on average by 0.9 per cent per year, and sulphur dioxide emissions to decrease on average by 0.8 per cent per year for the period 1989 to 2010.

A-3-2 Ontario Energy Demand Forecasts

Ministry of Energy (MENY) - Taken from the June 1991 Staff Discussion Paper titled **"Potential for Energy Conservation and Carbon Dioxide Reduction in Ontario"**.

MENY has outlined two scenarios: first, the Ministry's amended 1989 Reference scenario, and; second, a High Conservation scenario as outlined in Table 3.

Key Assumptions in Forecast

The Ministry's amended 1989 Reference forecast is the starting point for the estimates of potential savings. This scenario reflects lower expectations for industrial growth compared to the Ministry's previous (1989) Reference outlook, in light of industry projections and slow recovery from the recession. The main assumptions for the 1988 to 2005 period are:

- Energy demand will grow by 1.4 percent a year from 1988 to 2005, assuming an economic growth of around 2.6 percent a year (a 1988 base is used because this is a proposed base year for CO_2 reduction targets.)

- Population grows by almost 2 million to 11.4 million in 2005, averaging 1.5 percent a year. (This does not take into account Canada's new immigration policy).

- Output grows at 2.6 percent a year in the goods-producing sector, reflecting a strong industrial base, and continued growth in capital investment, but energy-intensive industries grow more slowly. Service activity also grows at a steady pace of 2.7 percent a year.

- Crude oil prices rise from about $18 per barrel (1990 U.S.$) to $23 per barrel

by 2000. Natural gas wholesale prices rise by 6-7 percent a year (2 percent a year in real terms). Electricity prices rise slightly faster than inflation in the early 1990's then level off in line with inflation.

- Automobile stock increases by 1.9 million, to give a total of 6.5 million by 2005, and demand for freight transportation grows strongly.

- Goods-producing industries' output grows 2.6 percent a year, with energy-intensive industries growing at 1.1 to 2.8 percent and other manufacturing expanding at 2.7 percent a year.

Projections

Within the **Baseline** scenario (2005 Projection), **total secondary energy demand grows at 1.4 percent** a year over the period from 1988. Electricity demand grows the fastest at 2.3 percent a year, followed by natural gas, with oil and coal demand the slowest (Table 3). These moderate growth rates reflect a moderate outlook for economic growth with slow recovery in industry, and continued efficiency improvements in energy using equipment. This scenario does not include major efforts to reduce energy demand to improve the environment.

For comparison, a **High Conservation** scenario is used to highlight the potential reduced energy use and also, the reduced CO_2 emissions that result. This high conservation forecast has moderate industrial growth and optimistic adoption of energy efficiency measures. Ontario's **secondary energy demand growth i under 0.5 percent** a year, close to a zero energy growth outlook. This would be less than one-fifth the rate of economic growth and less than one-third the Ministry's energy demand projection in the baseline outlook. Energy intensity per dollar of economic output would be reduced to two-thirds of its current level.

Carbon Dioxide Emission Projections

With energy demand growing, CO_2 emissions are projected in the baseline scenario to rise to 195 megatonnes by 2005, an increase of 19 percent. This is slower than energy growth over the period, in part because natural gas use grows faster than that of oil or coal, both of which emit more carbon when burned. Electricity-related CO_2 emissions would grow from 32 to 34 megatonnes on the assumption that new gas-fired capacity provides additional needs in 2005; no new nuclear capacity beyond Darlington is constructed.

To achieve a 20 percent cut in CO_2 emissions from 1988 levels by 2005 would require a cut to 131 megatonnes. With the forecast growth of 19 percent, the proposed Toronto Conference target reduction is equivalent to 39 percent of 1988 levels. In terms of CO_2 emissions per unit of economic output, achieving this target would involve cutting CO_2 intensity in half.

Table 3 - Ontario Energy Outlook, 1988-2005

	1988 Base	2005 Projection	Difference From 1988 (%)	2005 High Conservation	Difference From 1988 (%)
1. BY FUEL		PETAJOULES			
SECONDARY ENERGY					
Oil	808.7	971.2	20%	776.1	-4%
Natural Gas	744.2	938.0	26%	816.5	10%
NGLs	30.9	38.9	19%	38.6	25%
Coal	205.0	245.0	20%	197.4	-4%
Wood/Waste	90.0	110.4	23%	97.4	8%
Electricity	462.4	679.2	47%	606.9	31%
Total Secondary Energy	2,341.2	2,980.7	27%	2,532.8	8%
2. BY SECTOR					
Residential	484.9	554.2	14%	494.6	2%
Commercial	334.4	454.1	36%	370.8	11%
Industrial	903.3	1,171.2	30%	1,046.4	16%
Transportation	618.6	801.2	30%	621.0	0%
Total Secondary Energy	2,341.2	2,980.7	27%	2,532.8	8%
3. CO2 EMISSIONS		MEGATONNES			
Residential	19.0	19.4	2%	17.8	-6%
Commercial	10.9	12.8	17%	10.4	-5%
Industrial	50.1	62.1	24%	53.5	7%
Transportation	42.4	54.9	29%	42.4	0%
Refineries, Pipelines	8.9	10.2	15%	8.5	-4%
Electricity Generation	32.3	33.8	5%	20.7	-36%
Non-Energy	0.8	1.8	—	1.8	—
Total Energy-Related	164.3	194.8	19%	155.0	-6%

Source: MENY, 1991

Under the Ministry forecast, amended to reflect lower expectations for industrial growth, CO_2 emissions are forecast to be 19 per cent above the 1988 level by 2005. Under the optimistic and challenging high conservation scenario, CO_2 emissions are 6 per cent below the 1988 level by 2005.

Summarizing the energy and CO_2 savings potential above for each sector leads to the high conservation projection that total energy-related CO_2 emissions could be cut to 155 million tonnes by 2005 in this scenario. This would be 20 percent below forecast and 6 percent below 1988 levels.

Emissions from fuel use, compared to 1988, would fall in the residential and commercial sectors, be unchanged in transportation, and rise some 7 percent in industry. However, electricity-related CO_2 emissions, including those from cogeneration, would fall by one-third. This high conservation projection is a challenging scenario. Although optimistic, it does not exhaust the full potential for energy savings, as it does not assume 100 per cent adoption of all actions in all sectors. However it would require major changes such as:

- improving new car fuel economy so that it is 30 per cent better than today's levels by 1995;

- raising transit's share of all urban travel in Ontario from 9 per cent to 13 per cent;

- reducing fossil fuel space heating needs by 28 per cent, by replacement with natural gas;

- industry becoming one-quarter less energy-intensive by 2005 by retrofitting existing facilities and introducing new highly-efficient facilities and processes.

Table 4 - Comparison of Forecasts

Scenario --- Assumptions Indicators	Scenario 1 NEB (1991) Control Case	Scenario 2 MENY 2005 Updated Base Case	Scenario 3 MENY 2005 High Conservation
Real GDP growth rate (% per year)	2.3	2.6	2.6
World Oil prices in 2005 (per barrel)	$25.05 (US 1990 $)	2000: $23 (1990 US $)	2000: $23 (1990 US $)
Natural Gas prices (real % increase per annum and/or total 1988-2005)	110% increase (1989-2010)	2	2
Electricity Prices (real % increase per annum and/or total 1988-2005)	Ontario: Residential 20.6% increase Commercial 35.1% increase Industrial 37.3% increase (1989-2005)	To 1995: Increase more than inflation. After 1995: Constant with inflation.	To 1995: Increase more than inflation. After 1995: Constant with inflation.
E/GDP decrease (% per annum and/or total 1988-2005)	21.7% decrease (1989-2005)		33% total
Population growth (% increase per annum)	Canada: 0.9 Ontario: 0.9 (1989 - 2010)	1.1	1.1
E/Capita (% increase per annum)	27.8% (approx.) (1989-2005)		
CO_2 emission (% change for 1988 - 2005)	19.9% (1989-2005)	18.6%	-6.0%
Projected Total Energy Demand (% change per year and/or total 1988 - 2005)*	Canada: 20.7% Ontario: 20.5% (1989-2005)	1.4% per year	Less than 0.5% per year or 8% total

APPENDIX B STAKEHOLDER LIST AND VIEWS - ENERGY

List of Stakeholders consulted by Task Force

Code Key 1 = Comments on Consultation Document
2 = Brief Submitted
3 = Stakeholder Forum or Presentation

INDUSTRY/INDUSTRY AND COMMERCE ASSOC.	CODES
Air Transport Association of Canada	1
Canadian Institute of Energy	1, 2
Canadian Petroleum Products Institute	1, 2
Canadian Nuclear Association	2
Canadian Black River Petroleum	2
Canadian Appliance Manufacturers Association	2
Canadian Petroleum Association	1, 2
Canadian Gas Association	2
Conference Board of Canada	1
Consumers Gas	2
Dow Chemical Canada Inc.	1, 2
Falconbridge Ltd.	1, 2
Imperial Oil	1, 2
Independent Power Producers Society of Ontario	1
Integrated Energy Development Corporation	1, 2
Motor Vehicle Manufacturers Association	1, 2
Municipal Electrical Association	1, 2
Ontario Chamber of Commerce	2
Ontario Natural Gas Association	1, 2, 3
Shell	1, 2
Suncor Inc.	2

INDIVIDUALS	CODES
Holt, W.	1
Hughes, F.	1
Mawdsley, R.	3
McKinnon, D.	3

ALL BRIEFS ARE AVAILABLE FOR REVIEW FROM THE ONTARIO ROUND TABLE IN SEPARATE VOLUME.

NON-GOVERNMENT/NON-INDUSTRY ORGANIZATIONS	CODES
Canadian Environmental Law Association	1
Conservation Council of Ontario	2
Energy Probe	2
Energy and Chemical Workers Union	2
Int. Institute of Concern for Public Health	1, 2, 3
National Energy Conservation Assoc.	2
Northwatch	1, 3
North Care	1, 3
Ontario Environmental Network	1
Ontario Federation of Labour	1, 2
Recycling Council of Ontario	2
The Presbyterian Church of Canada	2
Canadian Union of Public Employees- Local 1000 (Ontario Hydro Employees Union)	1, 2
Canadian Union of Public Employees (Ontario Division)	1, 2, 3

NATIVE GROUPS	CODES
Union of Ontario Indians	1, 3
Assembly of First Nations	1

EDUCATION	CODES
Canadian Energy Research Institute	1
Energy Educators of Ontario	1, 2
University of Waterloo	
York University	2

GOVERNMENT AND GOVERNMENT AGENCIES	CODES
Energy, Mines and Resources Canada	1, 2
Ministry of Municipal Affairs	2
Ministry of Treasury & Economics	2
Ministry of Energy	1
Ontario Hydro	1, 2, 3
Toronto Transit Commission	1, 2
GO Transit	2

ALL BRIEFS ARE AVAILABLE FROM THE ONTARIO ROUND TABLE IN SEPARATE VOLUME.

STAKEHOLDER VIEWS - ENERGY

This Appendix outlines in summary form the views of stakeholders on issues relating to sustainable development as raised by the Task Force or as identified by stakeholder feedback. Each summary lays out areas where general agreement by the majority of stakeholders exist and presents a range of views and options expressed by stakeholders.

The consultation document, which outlined eight general issue areas or themes related to sustainability in the sector, was circulated to approximately seventy stakeholders.

What follows is a condensed summary of stakeholder comments received by the Task Force in response to its consultation document, from community and multi-stakeholder consultations undertaken in Timmins and Toronto respectively, and from individuals, companies and associations that made presentations to the Task Force.

In total, some sixty submissions were received by the Task Force, with roughly half relating to the energy sector.

The issues for which energy sector stakeholder views are presented are as follows:

Decision Making;
Full Cost Pricing and Accounting;
Information and Education; and
Technology.

The two central themes of protecting the biosphere and enhancing competitiveness are reflected in the comments received either directly or indirectly on other issues.

Issue - Decision Making

All stakeholders recognize the importance of and need to improve decision making processes as a means of achieving sustainability.

Areas Where General Agreement Exists

1. The need for more open and cooperative decision making processes was agreed to by all stakeholders. While the majority indicated that all legitimate stakeholders should be involved in public decision making processes, several stakeholders continued to call for close cooperation between industry and government in the setting of energy policy and program priorities.

For multi-stakeholder processes to be successful, all stakeholders agreed that those involved in the process need to be well informed, that the processes by which public policy, programs and legislation are set need to be much more transparent than at present, that feedback needs to be given as to what decisions were taken, what options were considered and what rationale was

used.

2. It was also generally agreed that a clear set of provincial priorities and objectives need to be established relating to sustainable development. Priorities for energy, economic and environment policy should not be conflicting either between departments/ministries within a given level of government or between provinces and the federal government.

3. It was also agreed that the information available upon which to base decisions relating to environment and economy is lacking. (see next issue)

Other comments raised by stakeholders included:

- need to integrate all energy forms in energy planning
- need to focus on renewables, efficiency and micro solutions
- Round Table processes should be used to resolve significant problems
- Ontario Hydro should move to become a full power utility
- government should set priorities, define a level of environmental quality, and marshall the necessary resources to achieve this level, standards should be tough but fair
- government should ensure efficiency but not control the need for energy
- sustainable development needs to be a priority for all government departments and agencies
- need to work in partnership with Native Canadians on non-traditional energy developments

Issue - Information, Education and Measurement

All stakeholders recognize the need to collect better information relating to environment and economy in the energy field. The ability of stakeholders on opposite sides of the issue to agree to a specific course of action in the absence of clearly defined problems or opportunities is limited.

Areas Where General Agreement Exists

1. State of the environment reporting should be undertaken at the provincial and national levels. To the extent possible, these information systems should avoid duplication.

2. Most stakeholders agree that current prices for goods and services do not reflect the environmental and social costs associated with their production or consumption. As prices in a market economy play such an important role, this represents a significant deficiency in our present market based system.

3. It was also generally agreed that valuing some of these externalities is difficult but that progress towards doing so needs to be made

Other comments raised by stakeholders included:

- product labelling would facilitate informed choice by consumers
- current incentive systems need to be examined
- international dimensions need to be better defined
- governments should encourage full disclosure
- environmental assessments of frontier developments need to be undertaken
- both supply and demand side stresses need to be considered
- information sharing by stakeholders needs to be explored
- energy/environment linkages need to be improved
- benefits and costs of particular actions need to be fully assessed; inter-jurisdictional cooperation needs to occur
- there needs to be a system by which we monitor quality of life
- measuring progress may be the most important issue
- being able to measure progress is years away
- need both micro and macro indicators
- need results oriented targets
- need to promote college level courses on energy

Issue - Technology

All stakeholders recognize the potential to improve both our environmental performance and enhance our competitive position through the development, application and commercialization of cleaner, more resource efficient technologies. This applies for both the producer as well as the consumer.

Technology is highly regarded by industry as the solution to environmental concerns. Through advanced technologies, industry believes society will eventually be able to solve its economic and environmental problems. Environmentalists among others are much less hopeful about the ultimate contribution that technology will play.

Areas Where General Agreement Exists

1. More incentives need to be put in place in order to encourage the development, adoption and commercialization of sustainability enhancing technologies

2. Numerous currently available technologies exist and are under utilized by both producers and consumers alike

3. Small hydro, cogeneration and renewables energy resources require promotion.

Major divergences of opinion were evident when stakeholders discussed the incentives they felt to be most appropriate.

Industry would generally like to see more lenient tax treatment of expenditures related to environmentally responsible/efficient plant/equipment uptake and joint industry/government regulation striking committees that set environmental performance standards on what is technically and economically achievable.

Environmentalists would prefer to see stiff penalties for failure to comply with tough regulations based on environmental thresholds, the "zero" discharge objective for persistent toxics and pricing resources at their full cost.

Economists argue for the use of market based incentives, including emission or discharge taxation and tradeable permits schemes among others, as cost effective means of meeting environmental goals and to encourage efficient use of resources.

Other comments raised by stakeholders included:

- non-competitive energy supply options should not be promoted
- credits for environmentally benign energy supply sources should be provided
- research and development incentives should be provided by government to encourage industry to improve its performance; best available technology that is economically achievable should be required of all sectors
- government represents the largest barrier to the development and uptake of more environmentally responsible technologies
- mitigative and adaptive strategies are required for global warming
- technology will not overcome wasteful energy habits

Sustainable technologies identified by stakeholders included:

. cogeneration
. district heating
. wind energy
. biomass conversion systems
. efficiency and conservation
. energy efficient end use products and services
. energy from waste
. small hydro
. solar energy systems
. cleaner fuels (hydrogen enriched)
. nuclear energy, and

Issue - Full Cost Accounting and Pricing

Although there was a considerable amount of disagreement raised over this issue, there was also considerable agreement that shifting prices for resources towards their full cost offers significant long term benefits to both our environment and economy.

As expected, the issue of full cost pricing and accounting raised the most debate at either end of the spectrum. More stakeholders recognize the potential down side to poor implementation of this principle than recognize the upside with careful and coordinated implementation. With environmental information being sketchy and scientific certainty on most issues an impossibility, the common ground offered by this mechanism for encouraging sustainable development activities is perceived to be smaller than it is.

Areas Where General Agreement Exists

1. All stakeholders recognize the need for level playing field among energy commodities so that one fuel is not favoured over another for reasons of caprice or ignorance

2. Segments of the energy and manufacturing industries generally favour the movement towards full cost pricing as do environmentalists, public health professionals and native communities

3. Almost all stakeholders advocated that actions not be taken unilaterally that would impair our ability as a society to make necessary changes as the need arises.

While competitiveness is certainly important, there exists a major difference of opinion between certain members of industry and government and others as it relates to sustainability. As defined in certain quarters within industry, sustainable development is interpreted to mean sustaining a particular industry. Members of the environmental movement and others regard sustainable development as sustaining those conditions which support human and other life even if certain human activities cease to exist

Comments raised by stakeholders included:

- pricing resources at their full cost will spur sustainable technologies, more sustainable human behaviour and efficiency by industry
- all energy should carry cradle to grave costing and it should be implemented in tandem with the United States
- industry needs low priced energy in order to compete
- international markets should determine prices for commodities that are traded internationally
- local/municipal rate structures for electricity are headed in the opposite direction to what they should to be
- full cost pricing is in contrast to supply and demand side incentives and subsidies
- increased taxes should be used to internalize costs
- few commodities bear their full cost, why single out energy
- subsidies to Ontario Hydro should be removed to encourage private sector generation of electricity
- full costing will lead to higher costs, capital outflows and job losses, but subsidies also hurt workers in the form of higher taxes

Other Comments that deserve mention

- Ontario and Canada have an international responsibility re sustainable development
- international partnerships are required
- reliable and secure supplies of energy outweigh conservation, efficiency and load shifting
- power should not be produced for export
- we require structural economic adjustments in order to protect the biosphere
- efficiency targets should stimulate excellence and innovation
- we require sensitive bio-indicators
- intervenor funding act has failed
- sustainability measures are important but they need to consider trade effects

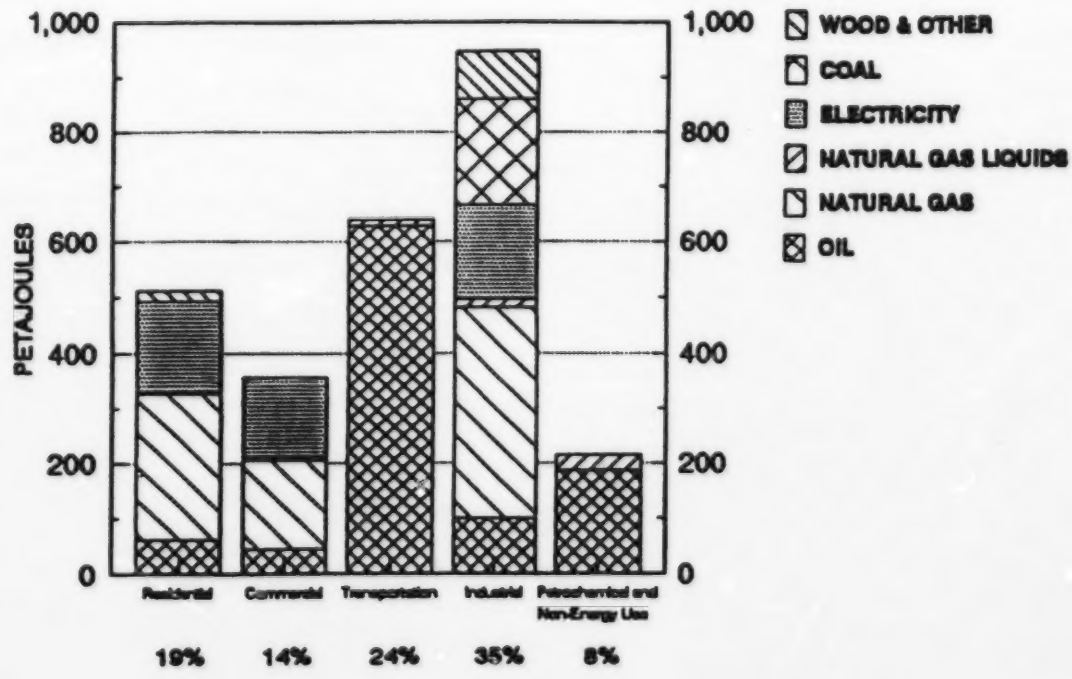
APPENDIX C ENERGY SECTOR CONSULTATION DOCUMENT

Brief Background to Ontario's Energy Sector

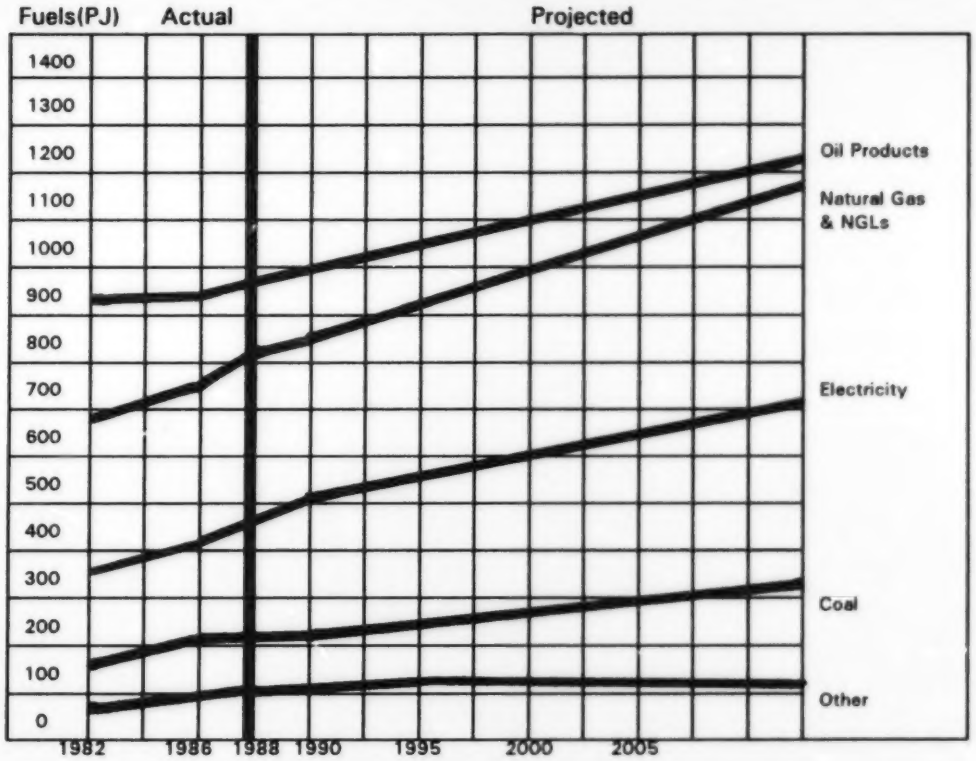
Ontario is predominantly an energy consuming province, accounting for about 33% of total Canadian energy use. In Ontario, industry accounts for 35% of end use consumption, followed by transportation (24%), residential (19%), commercial (14%), and petrochemical and non-energy uses (8%).

Almost all of the oil, gas and coal consumed in Ontario is imported into the province. Electricity generated from hydraulic sources and some of the uranium used in nuclear generation are indigenous resources. These energy forms compete in the end use market to a significant degree.

ONTARIO'S END-USE ENERGY CONSUMPTION
BY SECTOR AND FUEL 1989



Following strong growth in energy use during the 1970's, energy demand flattened during the 1980's with demand in 1988 only slightly above that of 1980. Energy use forecasts to 2005 predict overall growth rates in the order of 2% per annum. Although significant improvements in energy efficiency were achieved during the 1980's, some sectors within Ontario and Canada still lag behind their counterparts in other industrialised countries in terms of energy efficiency.

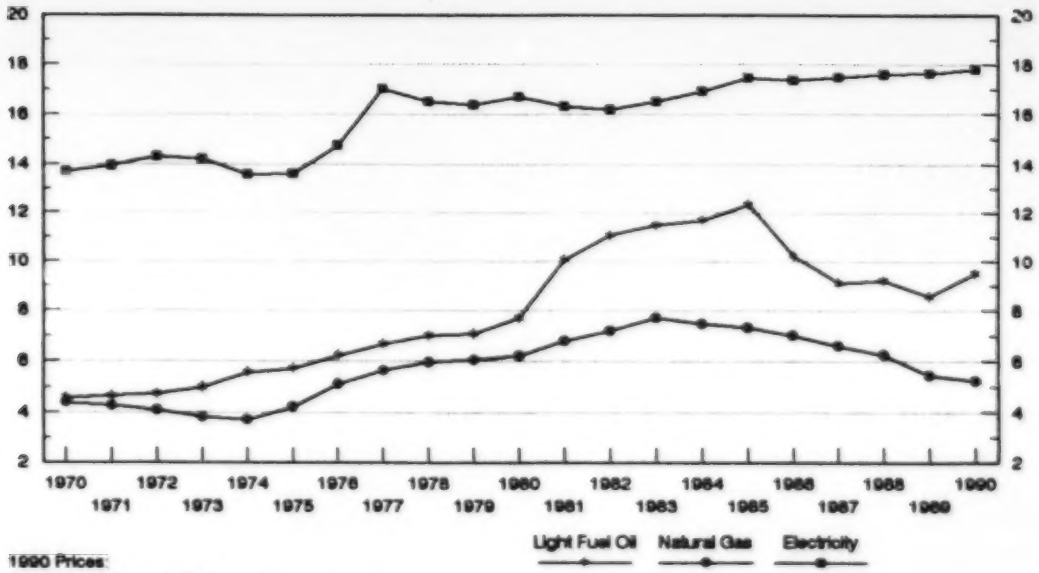


Most of Ontario's needs for oil, gas and electricity are provided by a few large suppliers. The oil industry consists of 4 major suppliers/retailers and a large number of independents. The gas sector has three large regulated utilities supplying almost 2 million customers. The electricity sector consists of Ontario Hydro, 311 municipal electric utilities and a handful of private utilities. Significant competition between and among energy commodity supplies and suppliers exists for market share.

In constant dollar terms, energy prices for electricity, natural gas and light fuel oil increased by 28%, 111% and 21% respectively over the period 1970 to 1990. The price for electricity increased in a relatively linear fashion over this period, while the prices for natural gas and light oil demonstrated greater variability, as these prices were influenced to some degree by world energy markets over the latter portion of this period. Relative price differences between jurisdictions can influence plant location decisions where energy is a major cost of production.

ONTARIO RESIDENTIAL ENERGY PRICES 1970-90

(1990$/GJ)



1990 Prices:
Electricity 6.41 cents/Kwh = 17.81
Natural Gas 19.7 cents/cubic metre = $5.23/GJ
Heating Oil 36.8 cents/litre = $9.51/GJ

Under the Canada/U.S. Free Trade Agreement, Canada and the U.S.A. will share a common continental energy future. We also share a common air and water natural environment to a considerable degree. The Great Lakes are the source of water for homes, industry and agriculture and the sink for effluent from industry and municipal waste treatment. The central continental air-shed is the source of air for over 100 million people and the sink for atmospheric emissions from one of the most industrialized areas of the world.

It is now recognized that the North American air-shed and the Great Lakes system form an important part of the global biosphere and the consequences of continued discharges into these systems have implications beyond the continent.

Issue 1: Working Together for Better Decisions

All Ontarians have a vital interest in the energy future of the province. Decisions made today, especially regarding future sources of supply, may have implications for generations to come. At present there is little opportunity for all stakeholders and constituencies in Ontario's energy future to work together on issues that affect the course of energy development in the province.

At present, the government weighs the positions of industry and other stakeholders in making decisions on matters of public policy. Energy corporations lobby on proposals for new policy, regulations and programs. Environmental and public interest groups do likewise from their perspective. At present, disclosure requirements are often set by government or the regulatory process and are part of the win/lose approach to many such proceedings, such as the current review of Ontario Hydro's demand supply strategy by the Ontario Environmental Assessment Board.

As part of a more consultative and constructive approach, information sharing between stakeholders could be an important first step. Establishing multi-sectoral processes to set priorities, improve information flow and facilitate cooperative dialogue could greatly improve the quality of decisions we make. Annual workshops and conferences on energy-environment issues would be one way to improve communication among industry, government and public interest groups. Another suggestion is establishing one or more "Round Table" type forums to address specific energy, environment, and economy issues.

What other opportunities exist to improve the quality of decisions made in this sector?

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Issue 2: How much energy do we need?

There is a high level of agreement that Ontarians can greatly assist our own transition to a more sustainable future by ensuring that every unit (BTU or gigajoule) of energy we buy is used efficiently in providing essential energy services.

Even so, one of the most contentious issues facing Ontarians is determining what level of energy services we need to maintain an acceptable quality of life over the longer term? Within certain bounds we can use as much energy as our budgets permit, but perhaps this is because energy and energy services are relatively inexpensive in relation to our disposable incomes and because environmental impacts of energy use do not now figure prominently in such decisions. The buffering capacity of our atmosphere has not figured prominently in energy discussions until only recently. Improving the efficiency of the energy services we buy and cutting out non-essential uses (conservation) are avenues which most people understand and appear to agree are important. Barriers to these transitions include today's fast-paced convenience-oriented lifestyle, an historic lack of integrated resource planning (including the relative benefits of specific fuels in providing certain energy services), slow uptake of energy efficient technology, and energy pricing/accounting systems which do not reflect economic and environmental impacts as fully as they might.

The transportation sector perhaps illustrates this most clearly. Although vehicle fuel economy per passenger mile has improved significantly over the past 15 years, there is more urban commuter travel than ever and public transit usage is decreasing. While the long term solution may lie in alternative urban designs, Ontario's progress in reducing private commuter traffic in favour of public transit is well behind that of European countries.

Perhaps a focus of our energy policy for the 1990s should be on developing a competitive market for energy services - space conditioning (heat, hot water and air conditioning), lighting, industrial torque and motive power, and mobility, rather than on ensuring competition between energy commodity supplies and suppliers. Deregulation and removal of barriers to entry may ensure greater choices for end users. Credible information and responsibility for the purchase of energy services go hand-in-hand with choice.

A related policy issue is whether Ontario's energy supply industries should invest more in providing efficient energy services to their customers and less in supply and transportation systems for delivery of energy commodities. Integrated Resource Planning (IRP), as a process under which regulated energy industries must justify that their investment plans provide an appropriate balance of supply and demand management initiatives, has proven to be of value in this regard.

What other options exist to improve our efficient use of energy, integrate local and renewable energy sources and to reduce our wasteful use of energy?

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Issue 3: Protecting the Biosphere

The use of coal, oil, natural gas and electricity are not without impacts on the natural environment. The production and transportation of coal, oil and, to a lesser degree natural gas also create environmental impacts: first from the transportation infrastructure; second from spills and leakage; and third from infrequent but major accidents such as the Exxon Valdez. Electricity production in Ontario by hydraulic and nuclear plants may affect water quality or produce trace emissions of radioactive materials. Nuclear power also leaves a legacy of high level nuclear fuel waste requiring safe disposal and perpetual care.

Energy conversion and use significantly impact the atmosphere. The inefficient combustion of fossil fuels, particularly gasoline, is the major source of urban air pollution from substances including unburned hydrocarbons, volatile organics and carbon monoxide. The use of electricity for refrigeration and air conditioning involves equipment containing chlorofluorocarbons (CFCs) which are a major cause of stratospheric ozone depletion.

The main strategy currently in place to reduce the impact of energy use on the biosphere is for industrialised countries to improve the efficiency of energy production and use and to switch to "cleaner" fuels such as natural gas.

Air pollution standards in place are aimed at protecting sensitive receptors (people, plants and animals) or reducing environmental damage. The focus has been on reducing the effect of conventional air contaminants such as sulphur dioxide, nitrogen oxides, particulate matter and hydrocarbons. Two types of standards are commonly used: impingement or ambient air quality standards and emission standards which limit the amount of emissions per unit of fuel burned or per unit of time.

Ontario's standards are largely based on ambient air quality although specific requirements exist for certain power plants and smelters under the Countdown Acid Rain Program. The province is proposing new standards under the Clean Air Program (CAP) based on the degree of hazard posed by the contaminant in question. There is also recognition of the need to reduce emissions of greenhouse gases in response to the 1988 Changing Atmosphere Conference held in Toronto including the federal government Green Plan and the Ministry of Energy discussion paper on Global Warming. Several jurisdictions in Europe, including Germany and Sweden have adopted carbon emission reduction targets.

Public health groups are concerned that present standards deal only with single contaminants and are not based on the effects of long-term exposure to a variety of pollutants. They are also concerned that there is no systematic approach to protect public health via air, water and food pathways from the thousands of man-made toxics released into the environment daily. The public is increasingly concerned about the effects of environmental contaminants on human health.

As a means of reducing the environmental damage caused by conventional contaminants, several jurisdictions are proposing to adopt or have adopted emission trading programs which will allow companies whose emissions are below their permitted amounts to sell their "spare" emission rights to others who are or who anticipate being above their permitted amount. The U.S. Clean Air Act sets a cap for emissions of sulphur and nitrogen oxides and allows emission trading within this predetermined limit.

What are some other policy options to reduce the environmental impacts of energy production and use that can benefit both our environment and economy? By which means can their introduction be most effectively implemented?

Comments_____

Issue 4: Paying the full price for energy

The current price of energy commodities and energy services may not necessarily reflect the full cost of the resource (including production, transmission/transportation and use). This is in part due to the pervasive influence of supply incentives, subsidies, differential tax treatments and the lack of accountability for the environmental and social costs of energy use (including health impacts and ecosystem interruption). For example, electricity generation by Ontario Hydro does not require a return on investment for the province, interest on its debt is provincially guaranteed thereby lowering the cost of financing its capital programs and electricity rates, and its nuclear liability is limited to $75 million, effectively reducing the price for electricity.

Resource undervaluation leads to increased use and reduced emphasis on efficiency. The issue is not simply one of raising the relative price of energy, but more one of raising the relative price of energy and lowering relative prices or rates of taxation in other areas so that the costs of resource uses better reflect their true cost to society. Also of concern is that an over assessment of "externalities" associated with energy use could lead to reduced economic competitiveness for Ontario in relation to other jurisdictions.

Another issue in this area is rate design. At present most unit rates for energy decline as more energy is purchased. Some rate structures include minimum payment arrangements which include a certain amount of "free" energy. Although these rates are designed based on cost causality principles, they may be counter-productive to the wise purchase and use of energy services.

Means of ensuring energy prices reflect their full costs include removal of subsidies, the application of uniform taxation, the removal of artificial liability limits, and the inclusion of the cost of environmental and social "externalities". The offset notion, or revenue neutrality issue, should again be emphasized. Various economic analysis methods are being developed which include real dollar cost estimates for energy production and consumption emissions and their impact on human health and the environment.

What are the most appropriate means of ensuring that energy prices reflect their full costs of use?

Comments_____

Issue 5: Respect for Nature and the Rights of Future Generations

The concept of sustainable development requires Canadians to not run down the energy capital of the country by wasteful or unnecessary consumption but leave viable energy resources as a legacy for future generations.

Canada's new sources of conventional energy in the next century will be more expensive and will likely require a move from traditional to frontier areas of the country including the continental shelf off the east coast. Ensuring adequate energy supply without environmental disruption will likely require significantly greater emphasis on renewable and non-traditional forms of energy as well as appropriate risk management techniques. For traditional energy development in our frontier and offshore areas the potential for damage is great. These lands and seas provide support for our native peoples and their traditional lifestyles, wildlife and other essential components of our biosphere and for the offshore fishery. Potential for conflict in these and other environmentally sensitive areas is an ongoing concern. Protecting important ecological areas and the rights of future generations must be as central in any resource development plan as economic viability.

What options exist to reconcile our needs for future energy services and economic viability with environmental stewardship?

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Issue 6: What roles should government and private sector play?

Governments have played a major role in Canada's energy developments for many decades. Until 1985, the Canadian energy sector was one of the most regulated in the world. Government control of the oil and gas sectors extended from ownership of resources to taxes at the pump. The Ontario gas industry and gas users were not allowed to buy gas in a free market until 1986 and vestiges of the regulated era still exist in the "core market" policies of the Alberta government. The electricity sector in Ontario has been an almost absolute public monopoly under Ontario Hydro for 80 years. Only in the past three years has access to private power producers been facilitated.

Canadian energy policy largely remains supply-oriented: ensuring continued supplies of reliable, competitively priced oil, gas and electricity for domestic use and for export. The incentive schemes of the federal government are primarily geared to enhancing supply. For example, between 1984-1989, the federal government spent $4 billion a year on supply-side incentives with only $40 million going towards energy efficiency initiatives. In 1991, Ontario Hydro will

spend $4 billion on new supply and $240 million on demand management. At government direction, a further $240 million is to be diverted from nuclear design to efficiency initiatives commencing in 1992. Research and development efforts have to a large degree shared the same conventional energy focus, often at the expense of making progress on renewable alternatives and energy efficiency improvements.

An interesting point for consideration is that during the past decade conservation and increased efficiency of energy use in Ontario made available more generation capacity than did physical expansions in the capacity of the generating system.

An important issue is whether the movement to a more sustainable energy future can be facilitated by government through further supply deregulation. Is it a role of government to remove barriers to competitive market forces in the provision of energy services or commodities? Is there also a role in the setting of emission or efficiency targets for energy use as a means of realizing environmental objectives?

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Issue 7: The role of technology in sustainability

New technological developments and their wide spread adoption in both the supply and conversion of energy into useful services are important for developed and developing countries as each works towards sustainability. Technological developments over the past few decades have led to significant reductions in the environmental impacts associated with energy use and significant gains for industry and others in reducing expenses, becoming more efficient, and pursuing new product and market avenues.

Barriers to successful implementation of technological solutions include lack of information or understanding about specific technological capabilities, less than effective communication among decision makers, researchers and operations people within industry and government, and the lack of certainty over market acceptance of commercial applications. In general, many users have not taken full advantage of the savings afforded by higher efficiency products and processes.

Major efforts are currently being taken to improve energy efficiency in Ontario to enhance our competitive position internationally. Much of our historic focus has been centred on traditional forms of energy supply rather than encouraging an environmentally responsive economic system where efficiency and sustainability are viewed as an important goals.

Several options for encouraging the development and adoption of sustainable energy supply and conversion technologies include promoting the potential of existing technologies, channelling research and development money into sustainable alternatives, providing incentives to major energy users to convert inefficient technologies into more efficient ones and raising the effective tax burden on energy to encourage further technological development and uptake.

What other options exist to encourage the development and adoption of economically viable and environmentally sound technologies in this field?

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Issue 8: Measuring progress toward sustainability goals

Conventional indicators of economic performance and related reporting systems may not be adequate for the task of measuring progress towards our sustainable development goals. In addition, good baseline ecosystem and human health response data are lacking. New measures and systems which account for resource capital and environmental effects of economic activity will be needed at the corporate, provincial and national levels.

Some possible macro-level measures include: non-renewable resource use; tonnes of carbon/carbon equivalents emitted; and tonnes of carbon dioxide, carbon monoxide, sulphur and nitrogen oxides emitted per unit of economic activity. Other measures would reflect specific targets for stabilization/reduction of greenhouse gas emissions or the phase-out of stratospheric ozone-depleting substances.

Full cost accounting is the way in which corporations and public sector agencies need to report on their use of the energy resources, the stock of resources remaining, and the environmental effects of energy production, transportation and use. Generally Accepted Accounting Principles are now the standard and work is under way by the Canadian Institute of Chartered Accountants to extend these principles to include Generally Accepted Environmental Accounting Principles (GAEAP).

The concept of full cost accounting could also be extended to the level of the national or provincial accounts (Gross Domestic Product). Several international demonstrations of this approach are currently under way. As well as reporting economic output, associated natural resource capital stocks and flows and environmental emissions could be reported to provide a more complete picture of the inputs and outputs associated with our economic activities.

What other considerations need to be reflected in adjusting our measurement systems to reflect progress towards sustainable development in this area?

Comments

Please Complete the Following information:

Organization _____

Address _____

No. Street Unit/Suite

_____

City/Town Province Postal Code

Telephone _____

Area Code Number

Facsimile _____

Area Code Number

Individual Responding Mr./Ms./Miss/Mrs./Dr. _____

Position/Title _____

Telephone _____

Area Code Number

Please give details of Constituency/Membership whose views are represented

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Would you like to receive a copy of the draft Task Force report for comment? Yes ☐ No ☐

Thank you for your response and for being part of the Ontario Round Table on Environment and Economy!

Kindly return your brief and comments to:

Roger Higgin, Chair
Energy and Minerals Task Force
c/o Ontario Round Table Secretariat
790 Bay Street, Suite 1003
Toronto, Ontario M7A 1Y7

Your response will form part of the public record.